

Illinois Environmental Protection Agency
Bureau of Air, Permit Section
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Project Summary for a
Construction Permit Application from
Linde Gas North America, LLC for a
Hydrogen Plant adjacent to
CITGO's Existing Petroleum Refinery in
Lemont, Illinois

Site Identification No.: 197090ABF
Application No.: 07120053

Illinois EPA Contacts:

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Important Dates:

Application Received: December 31, 2007
Comment Period Begins: May 6, 2008
Comment Period Closes: June 5, 2008

I. INTRODUCTION

Linde Gas North America, LLC (“Linde”) has applied for a construction permit application for a Hydrogen Plant. The hydrogen plant will produce the hydrogen required for a project at the CITGO Lemont Refinery to enable production of Ultra Low Sulfur Diesel (ULSD) fuel. Linde’s application shows that the project would not be a major modification under 40 CFR 52.21, Prevention of Significant Deterioration (PSD) or 35 IAC Part 203, Major Stationary Sources Construction and Modification (MSSCAM).

II. PROJECT DESCRIPTION

Linde’s proposed Hydrogen Plant would be located adjacent to the CITGO Lemont Refinery southwest of the Village of Lemont in Will County. CITGO’s ultra low sulfur diesel project will enable the refinery to produce ultra low sulfur diesel as federal regulations require be used for diesel trucks beginning December 1, 2010. The project needs hydrogen to operate as hydrogen is used to react with and “extract” sulfur from diesel fuel materials with the sulfur then collected in the sulfur recovery unit at the refinery. The hydrogen will come from the new hydrogen plant proposed by Linde.

Although the emissions from CITGO’s ultra low sulfur diesel project are included in the emission summary for this draft permit (See Attachment 1 of the draft permit), CITGO has applied for a separate permit for their ultra low sulfur diesel project that includes an allowance for the emissions of the associated hydrogen plant. The hydrogen plant project and the ULSD project are considered to be a larger, single project for purposes of New Source Review regulations (i.e., PSD and MSSCAM). A more detailed description of the refinery’s ULSD project is included in the project summary for that draft permit.

The new hydrogen plant would use standard steam methane reforming technology to produce gaseous hydrogen using either refinery fuel gas or natural gas as a feedstock rich in methane. In reforming, the methane is reacted with steam at an elevated temperature in the presence of a catalyst to produce hydrogen. The principle emission unit in the hydrogen plant is the furnace or process heater in which feedstock is heated to the necessary temperature for the reaction to occur.

III. EMISSIONS

This project results in a significant increase in NO_x, CO, SO₂, and PM₁₀ emissions as defined by New Source Review regulations. This application includes a “netting exercise” to evaluate the net emissions increase for the project. This evaluation shows that the net increase in emissions from the project, when combined with contemporaneous increases and decreases in emissions are less than significant. Accordingly, New Source Review regulations are not triggered for the project.

IV. APPLICABLE EMISSION STANDARDS

All emission sources in Illinois must comply with the Illinois Pollution Control Board's emission standards. The Board's emission standards represent the basic requirements for sources in Illinois. The Board has standards for sources of nitrogen oxides, carbon monoxide, volatile organic material, sulfur dioxide, and particulate matter. The application for this project shows that it will comply with all applicable Board standards.

V. DRAFT PERMIT

The conditions of this permit would contain limitations and requirements that are intended to assure that the new hydrogen plant in combination with the ULSD project, will not be a major project for purposes of PSD or MSSCAM. The permit conditions establish appropriate compliance procedures, including testing, monitoring, recordkeeping, and reporting requirements. The Permittee must carry out these procedures on an on-going basis to demonstrate that the plant is operating within the limitations set by the permit.

The draft permit also contains two attachments. Attachment 1 provides a summary of the project emission increases. This summary includes each of the units within the proposed hydrogen plant and each of the units at the refinery affected by CITGO's ULSD project. The total of emission increases is compared to the New Source Review significant emission thresholds to determine whether a major modification would occur in the absence of netting. In this case, the project increases are significant for NO_x, CO, SO₂, and PM₁₀. Attachment 2 provides a summary of the netting analysis for NO_x, CO, SO₂, and PM₁₀. This netting analysis shows that the net emissions increases for NO_x, CO, SO₂, and PM₁₀ are less than significant. As a result, the project is not a major modification for purposes of New Source Review rules.

VI. REQUEST FOR COMMENTS

It is the Illinois EPA's preliminary determination that the application for the proposed hydrogen plant meets all applicable state and federal air pollution control requirements, subject to the conditions proposed in the draft permit. The Illinois EPA is therefore proposing to issue a construction permit for this project. Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit.